Agenda Item: **Sync Ad Hoc 4.4**

Source: **Ericsson**

Title: **Initialization of CFN Including Frame Offset**

Document for: **Decision**

1. Introduction

This contribution proposes a method of initializing the Connection Frame Number (CFN).

2. Discussion

The initialization of Connection Frame Number (CFN) is in [1], section 9.6.6, specified as having the same number as the Cell Frame Number. Moreover, it is stated in [1], section 9.5 (definition of Td), that one purpose of Td is to distribute discontinuous transmission periods in time, and also to distribute Node B-RNC transmission traffic in time.

The ability to use Td for an initial offset of CFN relative to Cell FN is limited to distribute the transmission load within one frame (10 ms). Hence, all UEs which go to dedicated channel in the same cell will have the same CFN, and the phase of the DPCH shifted maximum 10 ms relative each other.

Interleaving must be aligned for different interleaving depths within the same CCTrCH, shown in [2], figure 29.

Hence, in a cell in which many UE terminate/originate calls, there may be a number of UEs sharing the same interleaving alignment (within 10 ms), since they all have a common CFN relative the Cell FN.

Hence, in case large interleaving depths are used by many UEs, e.g. 8 frames, there will be a large peak load on the Iub transmission each 80 ms. Also the processing resources in the nodes may suffer from peak loads.

In order to make it possible for the RNC to distribute the load, procedures to make it possible for the RNC to schedule the initial phase of the Connection Frame Number relative the Cell SFN is proposed.

The timing relationship between PCCPCH and the DPDCH would then become
$CFN = Cell\ FN + OFF - Td$

as shown in the figure. Note that it should be ((Cell SFN) modulo (length of the superframe)) that is used.

CFN		0	1	2	3	4	

OFF - T_d

Cell FN	69	70	71	0	1	2
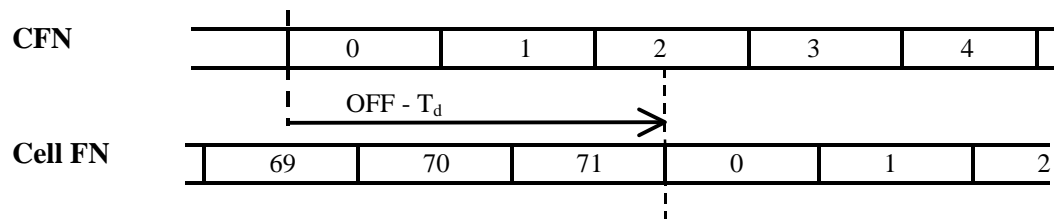
3.   Proposal

It is proposed to replace the first sentence in [1], section 9.6.6, by the following text:

"The initial value of CFN is set to the ((Cell SFN + initial offset) modulo (length of the superframe)) of the cell in which the dedicated channel (DPCH) is set up. The initial offset is defined by the RNC. This offset may include both a shift in a frame (Td), as well as a shift of the frame numbers (initial CFN offset)."

4.   References

[1] "UTRAN Overall Description", TS 25.401, v 1.2.1.
[2] "Physical Channels and Mapping of Transport Channels onto Physical Channels", TS 25.211, v. 2.2.1